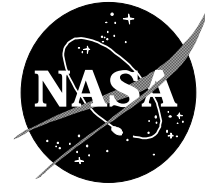


National Aeronautics and  
Space Administration

**Goddard Space Flight Center**  
Greenbelt, Maryland  
20771



## Laboratory Chief's Summary

Dear Reader:

Welcome to the Laboratory for Atmospheres' annual report for 2001. I thank you for your interest. We publish this report each year to describe the Laboratory and its work and to summarize our accomplishments.

We intend for this document to address a broad audience. Our readers include managers and colleagues within NASA, scientists outside the Agency, graduate students in the atmospheric sciences, and members of the general public. Inside, you'll find descriptions of our philosophy, our people and facilities, our place in NASA's mission, and our accomplishments for 2001.

The Laboratory's more than 400 scientists, technologists, and administrative personnel are part of the Earth Sciences Directorate of NASA's Goddard Space Flight Center. Together, we pursue our mission of advancing the knowledge and understanding of Earth's atmosphere and the atmospheres of other planets. In doing so, we contribute directly to two of NASA's primary Enterprises, Earth Sciences and Space Sciences.

We accomplished much in 2001. Laboratory scientists hosted 111 seminars, participated in 67 workshops, 98 science team meetings, 3 science policy meetings, published 179 refereed papers, hosted 164 short-term visitors, and participated in an array of educational activities.

The NASA/NOAA Joint Center for Satellite Data Assimilation (JCSDA) achieved significant accomplishments in 2001. JCSDA is designed to optimize the use of satellite data in NOAA's operational activities. In 2001, JCSDA installed computing infrastructure at Goddard that will deliver combined AIRS/MODIS products within 180 minutes of ingest. In addition, JCSDA distributed to its members the first version of a community-based fast radiative transfer model. On January 15, 2002, JCSDA achieved another milestone with the assimilation of QuikSCAT data at NCEP. This achievement arose from a substantial collaborative effort during 2001 among the Laboratory's DAO, NCEP's EMC, and NESDIS.

The Laboratory continued its active role in developing and calibrating new and improved instruments for spaceflight and field campaigns. Among these instruments are the Triana/EPIC instrument (Earth Polychromatic Imaging Camera), which was calibrated at Goddard; SOLSE/LORE, a demonstration flight instrument to test the type of ozone profile measurements to be used on NPOESS; and MEIDEX, an Israeli instrument to study aerosols over the Mediterranean Sea using TOMS and MODIS channels. Both SOLSE/LORE and MEIDEX were calibrated in our Laboratory's RCDF (Radiometric Calibration and Development Facility). Triana is now in storage at Goddard awaiting a flight of opportunity. MEIDEX and SOLSE/LORE are now scheduled for a July 2002 shuttle flight.

Our Laboratory developed the Holographic Airborne Rotating Lidar Instrument Experiment (HARLIE), a new lidar and remote sensing technique for measuring atmospheric winds without using Doppler information. On December 10, 2001, the Atmospheric Experiment Branch delivered the Neutral Gas and Ion Mass Spectrometer (NGIMS) flight model to Johns Hopkins University APL for integration onto the CONTOUR spacecraft. The instrument was managed and

built in the Laboratory with the help of Code 500. Special thanks go to Jack Richards, the NGIMS instrument manager.

The Laboratory had an exciting year participating in international field campaigns, where Laboratory members were PI's and active participants. We supported GTE/TRACE-P (Global Tropospheric Experiment/Transport and Chemical Evolution over the Pacific). Our real-time forecast products (based on SeaWiFS, TOMS, and DAO assimilation data) helped the GTE/TRACE-P team plan aircraft flights. Anne Thompson supplied satellite and meteorological analyses. We supported ACE-Asia (Aerosol Characterization Experiment) with field instruments and model forecasts of aerosols to guide flight planning. During TOMS3-F (Total Ozone Measurements by Satellites, Sondes, and Spectrometers at Fairbanks), Lab scientists from Code 916 studied the cause of differences between total column ozone as measured by TOMS and by ground-based instruments. In November, the Stratospheric Ozone Trailer arrived in Lauder, New Zealand, to participate in a Dobson intercomparison at the NDSC (Network for the Detection of Stratospheric Change). The trailer will also be used in a lidar validation campaign in April 2002. CAMEX-4 (Convection and Moisture Experiment) employed NASA and NOAA aircraft, satellites, and ground assets to study Atlantic basin hurricanes from August through September. Camex-4 also contributed to TRMM validation and calibration efforts. The MPL-Net (Micro Pulse Lidar Network) group installed an improved instrument to begin the third year of active monitoring of Antarctic cloud cover at the South Pole. The South Pole experiment site is part of preparations for next year's GLAS satellite mission. Chesapeake Lighthouse and Aircraft Measurements for Satellites (CLAMS) took place at Wallops Flight Facility July 10–August 2, 2001, to validate MODIS, MISR, and CERES aerosol and radiation measurements from the Terra satellite, and to enhance our knowledge of the ocean spectral surface reflectance and aerosols.

On April 17 and 18, the Goddard Micro Pulse Lidar (MPL) Network site detected an unusual elevated layer of haze considered to be Asian dust that was transported across the Pacific and North America. This was the East Coast's first ground-based lidar observation of the vertical profile of the dust. Two MP lidars were operating in Western China and on the NOAA ship Ron Brown off the coast of Japan during ACE-Asia. Another MPL site was in Oklahoma. In a significant human drama, real-time cloud ceiling height information from the MPL was made available to pilots as they attempted a rare nighttime landing at the Amundsen-Scott South Pole Research Station to evacuate the station's ailing doctor.

A significant part of the Laboratory's science has been extended by the increase of TRMM's orbit from 350 km to 400 km. This increase added about 2 years to the satellite's life. Bob Adler did an outstanding job advocating and justifying this change on behalf of the scientific community.

The 10<sup>th</sup> anniversary meeting for UARS was interrupted by the tragic events of September 11. The meeting adjourned after hearing the news, but reconvened offsite on September 12–13. After the instruments were shutdown September 24–30, science observations were resumed on October 1. UARS is now operating in a lower-cost "Traceability Mission Option" with the primary focus of providing validation/calibration measurements for upcoming missions: TIMED, SAGE III, ENVISAT-1, ADEOS II, EOS Aqua, and SORCE.

In 2001, many Laboratory members earned awards for their outstanding work. David Atlas was installed as an Honorary Member of the American Meteorological Society (AMS) at the 81st Annual Meeting in Albuquerque. Joanne Simpson is the only other Goddard scientist who is an Honorary Member. Wei-Kuo Tao was elected a Fellow of the AMS and received the certificate at the AMS annual meeting in January 2001. Marshall Shepherd and Dennis Chesters received the GSFC Group Award for "Outstanding Teamwork" on the Horizon (EO-3) Proposal Development Team. Stan Scott received the astronauts' Silver Snoopy Award, which is given for special

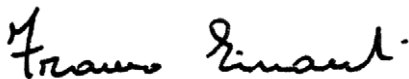
achievements on space shuttle and other manned flight missions. Stan was recognized for his outstanding contribution to the success of the ISIR experiment on STS-85. Hans Mayr received an invitation to present the CEDAR Prize Lecture at the joint CEDAR Quadrennial STP Symposium in June. Hans was nominated for his work on the "Theory of wave driven non-linear flow oscillations in the atmospheres of planets and the Sun." The Earth Observatory team was presented with NASA HQ's "Group Achievement Award." LaRC presented a group achievement award to our Laboratory members of the Aerosol and Polar Stratospheric Cloud Lidar Team who worked on the SOLVE mission. Siegfried Schubert of the Data Assimilation Office was recently approved by the American Meteorological Society council to become an editor of the Journal of Climate.

The year 2001 was also a time to bid farewell to valuable members of the Laboratory. Mark Schoeberl became the Chief Scientist of the Earth Sciences Directorate, and Jack Richards became the Assistant Director of Operations for the Earth Sciences Directorate.

I am pleased to greet the new members of the Laboratory. Arlyn Andrews from Harvard and Scott Janz from UMBC joined the Atmospheric Chemistry and Dynamics Branch. Caroline Maswanganye joined 910 as a student aid.

These developments occurred in a time of transition for the Laboratory. This should be my last year as Acting Chief of the Laboratory for Atmospheres, as we hope to find my replacement in 2002. I wish to thank the senior staff and the secretaries for keeping the Laboratory running while my attention is drawn even more to the Directorate as a whole. I'm grateful to Walt Hoegy for orchestrating the assembly and publication of this report, and for helping Chuck Cote with the Laboratory operations. I especially wish to thank Chuck Cote for his tireless efforts in ensuring the Laboratory stays on an even keel. His expertise, gained from 40 years of work at Goddard, and his dedicated efforts as the Associate Chief of the Laboratory are an invaluable contribution to this Laboratory's success.

Sincerely,

A handwritten signature in black ink, appearing to read "Franco Einaudi". The signature is fluid and cursive, with a small dot at the end.

Franco Einaudi, Acting Chief, Laboratory for Atmospheres, Code 910  
Director, Earth Sciences Directorate, Code 900  
Phone: 301-614-6786  
Fax: 301-614-6301  
E-mail: franco.einaudi@gsfc.nasa.gov